IN THE CLAIMS

Claim 1 (currently amended): ~~A diffractive transfer lens~~ An optical element for coupling a light source to a light conducting medium comprising:

a diffractive surface that is defined by a surface function that includes

a first phase function having angular symmetry and a first m value, and

a second phase function having radial symmetry ~~and~~, a cusp region and a second m value; wherein the cusp region has a discontinuous slope therein; wherein the first m value and the second m value are selectively adjustable to control launch conditions and manage reflections.

Claim 2 (currently amended): ~~The transfer lens~~ The optical element of claim 1 wherein the first phase function is a spiral phase function; and wherein the second phase function is a cone phase function.

Claim 3 (currently amended): ~~The transfer lens~~ The optical element of claim 2 wherein the spiral phase function can be expressed as follows:

$$\phi = m_S * \theta$$

where 'm_S' is a real number that describes how fast the phase changes as one traverses a circle about the center of the aperture; wherein 'θ' is an angular coordinate; and

the cone phase function can be expressed as follows:

$$\phi = 2\pi m_C * \rho$$

where 'm_C' is a real number that describes how fast the phase changes as one traverses a radial line from the center of the aperture;

wherein 'ρ' is a normalized radial coordinate; wherein ρ is equal to 1 at th edge of the aperture, and ρ is equal to zero at the center of the aperture.

Claim 4 (currently amended): ~~The transfer lens~~ The optical element of claim 3 wherein m_S is equal to =3 and m_C is equal to -2.

Claim 5 (currently amended): ~~The transfer lens~~ The optical element of claim 1 wherein the ~~transfer lens~~ optical element provides reflection management so that light reflected from the end of the optical fiber is not directed to a location at which light is emitted by the laser; and wherein the optical element provides favorable launch conditions so that light launched into the optical fiber avoids index anomalies along the axis of the optical fiber.

Claim 6 (canceled):

Claim 7 (currently amended): ~~The transfer lens~~ The optical element of claim 1 further comprising:

an optical surface for focusing the light onto the optical fiber; and

wherein the diffractive surface receives and collimates the light originating from a light source.

Claim 8 (currently amended): ~~The transfer lens~~ The optical element of claim 1 further comprising:

a packaging for housing the light source;

wherein the diffractive surface is disposed in the housing.

Claims 9 –18 (canceled)

Claim 19 (currently amended): A method for manufacturing a diffractive surface for use in ~~a transfer lens~~ an optical element comprising:

defining a first phase function having angular symmetry and a first m value;

defining a second phase function having radial symmetry ~~and~~, a cusp region and a second m value; wherein the cusp region has a discontinuous slope therein;

defining a surface function that includes the first phase function and the second function by selecting values for the first m value and the second m value to control launch conditions and manage reflections; and

employing semiconductor processing techniques to manufacture a diffractive surface for use in the transfer lens in accordance with the surface function.

Claim 20 (original): The method of claim 19 further comprising:

adding a third phase function to the surface function;

wherein the third phase function includes one of a lens phase function, an aberration control phase function, a prism phase function, and a grating phase function.

Claim 21 (new): The method of claim 19 wherein the optical element couples light from a light source to a light conducting medium; and wherein defining a surface function that includes the first phase function and the second function includes selectively adjusting the first m value and the second m value to increase one of coupling efficiency between the light source and the light conducting medium and misalignment tolerances between the light source and the light conducting medium.

Claim 22 (new): The optical element of claim 2 wherein the cone phase function includes a cross section that is one of a generally concave profile, a generally triangular cross-section, a generally convex profile, an inverted generally concave profile, an inverted generally triangular cross-section, and an inverted generally convex profile.

Claim 23 (new): The optical element of claim 3 wherein the values of m_S and m_C are selectively adjustable to control factors that include one of coupling efficiency, misalignment tolerances, and the amount of feedback.

Claim 24 (new): The optical element of claim 3 wherein the values of m_S and m_C are selectively adjustable to suit the requirements of a particular optical application.

Claim 25 (new): An optical element for coupling a light source to a light conducting medium comprising:

a diffractive surface that is defined by a surface function that includes

a first phase function having angular symmetry, and

a second phase function having radial symmetry and a cusp region; wherein the cusp region has a discontinuous slope therein; and

an optical surface for focusing the light onto the light conducting medium; wherein the diffractive surface receives and collimates the light originating from the light source.

Claim 26 (new): The optical element of claim 25 wherein the first phase function is a spiral phase function; and wherein the second phase function is a cone phase function.

Claim 27 (new): The optical element of claim 26 wherein the spiral phase function can be expressed as follows:

$$\phi = m_S * \theta$$

where 'm_S' is a real number that describes how fast the phase changes as one traverses a circle about the center of the aperture; wherein 'θ' is an angular coordinate; and

the cone phase function can be expressed as follows:

$$\phi = 2\pi m_C * \rho$$

where 'm_C' is a real number that describes how fast the phase changes as one traverses a radial line from the center of the aperture;

wherein 'ρ' is a normalized radial coordinate; wherein ρ is equal to 1 at the edge of the aperture, and ρ is equal to zero at the center of the aperture.

Claim 28 (new): The optical element of claim 27 wherein m_S is equal to =3 and m_C is equal to -2.

Claim 29 (new): The optical element of claim 25 wherein the optical element provides reflection management so that light reflected from the end of the light conducting medium is not directed to a location at which light is emitted by the light source.

Claim 30 (new): The optical element of claim 25 wherein the optical element provides favorable launch conditions so that light launched into the light conducting medium avoids index anomalies along the axis of the light conducting medium.

Claim 31 (new): The optical element of claim 1 further comprising:

a third phase function that includes one of a lens phase function, an aberration control phase function, a prism phase function, and a grating phase function.